John B. Williams

From: Alex Tan <Alex.Tan@uniti.com>
Sent: Friday, February 9, 2018 8:57 AM
To: John B. Williams
Cc: Matt Sanches
Subject: Re: River Oaks IP address problems

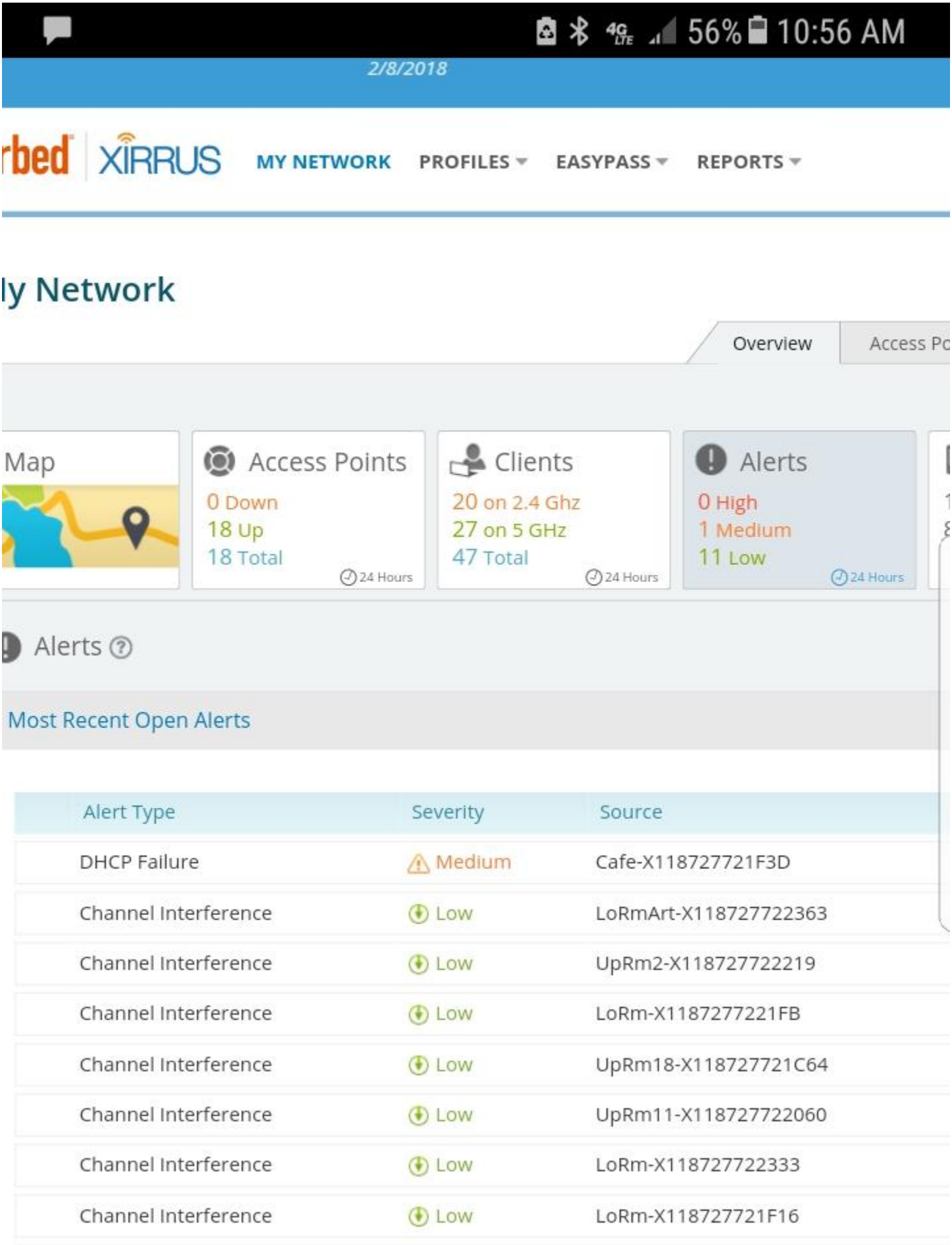
1) DHCP Failure alerts happen from time to time when a DHCP transaction from either the array (since the arrays get their addresses from DHCP) or, more likely, a device trying to get on the network via the array does not come back before the time-to-live expires. Heavy network usage and heavy simultaneous DHCP traffic can cause these conditions. If it does not clear up in minutes, your router's DHCP service and/or the array might need need to be restarted. Also, insufficient network addresses might trigger this alert, in which case that problem needs to be addressed.

2) Even though the 2.4GHz band has 11 channels, channels 1, 6, and 11 are the only ones used in real-world situations to avoid interference issues. Therefore practically all 2.4GHz radios normally choose one of those 3 channels unless the owner manually sets something else. I ran XMS-C's automated channel and power optimization feature yesterday after school let out, but that was insufficient to resolve the XMS-C alerts.

If you have not removed or turned off the old wireless network in the 2.4GHz band (including wireless features of printers that are capable of direct wireless printing without using the school network), then that will be one source of interference that shows up in the XMS-C alerts.

Another source of interference can be neighbors--the XMS-C Rogues list of unidentified wireless networks shows a wide variety of sources (some of the visible SSID's include MyVolvoVsHXd8, NETGEAR22, tl6d04e0, SYNC_XN9U26DN, MyRV_20218F0141701063, xfinitywifi, lyndadcarter, brooks family, LIBRARY-6 9141, HP-Print-F6-ENVY 4500 series, HP-Print-2A-Deskjet 3520 series, Aitkenfamily, ATT-HOMEBASE-8016, HP-Print-64-Officejet Pro 8620, Warhawk Wifi, Triniagaines32, Destinie Grayb@Ys iPhone, Beaub@Ys iPhone, DIRECT-B6-HP OfficeJet Pro 8710, travelingchica, WiFi Hotspot 4248, Mulhern Suburban, berry wifi, CODYSILVERADO, James Silverado, Carlee Nana, HOME-5600-2.4, natasia_2.4, rsmith56, HIDEAWAY GUEST, Gharkawifi-2.4, Verizon-SM-T378V-29C3, Dale Chevrolet, JUSTINS SILVERADO, LarrysTruck, Kimberly's iPhone, ROCafeteria, RORyland, RORyland-guest, etc.) that are producing a signal strong enough for one or more arrays to detect them and possibly interfere with the Xirrus arrays' wireless signals.

From: John B. Williams <jwilliams@itcaretech.com>
Sent: Thursday, February 8, 2018 10:57:44 AM
To: Alex Tan
Cc: Matt Sanches
Subject: Re: River Oaks IP address problems


56% 10:56 AM
2/8/2018
rbed XIRRUS
MY NETWORK
PROFILES
EASYPASS
REPORTS
ly Network
Overview
Access Po
Map
Access Points
0 Down
18 Up
18 Total
24 Hours
Clients
20 on 2.4 Ghz
27 on 5 GHz
47 Total
24 Hours
Alerts
0 High
1 Medium
11 Low
24 Hours
Alerts
Most Recent Open Alerts
Alert Type
Severity
Source
DHCP Failure
Medium
Cafe-X118727721F3D
Channel Interference
Low
LoRmArt-X118727722363
Channel Interference
Low
UpRm2-X118727722219
Channel Interference
Low
LoRm-X1187277221FB
Channel Interference
Low
UpRm18-X118727721C64
Channel Interference
Low
UpRm11-X118727722060
Channel Interference
Low
LoRm-X118727722333
Channel Interference
Low
LoRm-X118727721F16

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From: Alex Tan <Alex.Tan@uniti.com>
Sent: Wednesday, February 7, 2018 4:00:17 PM
To: John B. Williams
Cc: Matt Sanches
Subject: Re: River Oaks IP address problems

Some of the terminology you're using must have different meanings for you and me. By "network," are you referring to SSID's that wireless devices connect to and the passwords for them? If so, I must remind you that you didn't have any information or instructions for me regarding that, so I was forced to create an open SSID with a name that mimicked your then-existing SSID (RO_Wireless) as a placeholder. Are you using "network" to refer to the wireless SSID, or are you referring to something else?

As I mentioned in my reply (and my install summary), your original network set-up had 2 separate local area networks and that the new networking equipment throughout both the upper school and the lower school was set up to use only the upper school network. The fiber run between the upper school and lower school and the fact that you provided the upper school's network information for the as being for the whole school suggested that you intended to merge the LAN's into one. Therefore, your guess that "this used to be 2 separate networks and is being merged into 1" is correct.

Also mentioned in my reply, I noted that each of your 2 LAN's have 254 addresses potentially available, but the 3 new Juniper switches use a total of 3 static IP addresses, and there are at least 3 devices (e.g. network copiers, network printers, IP security cameras, etc.) that are not visible to my IP scanner software. In your query, you implied there could be 300 or more network devices. With the new network equipment connecting only to the upper school LAN, I agree that you likely have fewer addresses than you need. However, modifying your router's DHCP settings or otherwise re-designing your network to deal with this (or that you were likely to have more devices than a single LAN as currently configured could handle) was not mentioned in my install instructions, so I followed our normal installation processes, and things worked as installed when I left River Oaks.

Resolving the excess number of network devices is properly a network administrator's LAN management decision. It is beyond the normal scope of an install. Nonetheless, as a courtesy, I did reply with three potential solutions to your IP address problem. If this is insufficient, then perhaps we need to bring more people into this discussion.

From: John B. Williams <jwilliams@itcaretech.com>
Sent: Wednesday, February 7, 2018 10:39:36 AM
To: Alex Tan
Cc: Matt Sanches
Subject: Re: River Oaks IP address problems

I was not asking you to manage the LAN. My understanding is yall would install and setup/configure the network.

1) admin/teacher network
2) student network thay controls access during certain times of the day.

I know we did not have this issue prior to the new setup, hence why I asked.

I will have try and get access to the comcast boxes. My guess this used to be 2 separate networks and is being merged into 1. How many IP address do we have to assign out? 200 will not be enough.

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From: Alex Tan
Sent: Wednesday, February 7, 10:24 AM
Subject: River Oaks IP address problems
To: John B. Williams
Cc: Matt Sanches

First, let me say something that you undoubtedly know already: managing your LAN is beyond the scope of the install. Having said that, here are my thoughts regarding your problems.

Have you been able to determine how you are getting duplicates? For example, if your router's DHCP is set to hand out addresses in its range without regard for static IP addresses that are set on client devices, then you need to set up exceptions in DHCP to avoid issuing those static IP addresses. You already know 6 such client-side static IP addresses from my install summary e-mail: the 3 mystery devices at 192.168.1.11 through 192.168.1.13 and the 3 new Juniper switches at 192.168.1.21 through 192.168.1.23. This is where creating a list of static IP addresses (as opposed to DHCP-issued IP addresses) is crucial to managing your network.

Next, both your upper school and lower school IP ranges each have 256 addresses, of which 254 are available for use. As I mentioned in my install summary e-mail, the new network (as installed) uses only the upper school IP range. With over 300 network devices, you would need more than one octet of addresses in the new network. There a variety of ways you can do this; here are three of your options.

You could disconnect one end of the fiber connecting the upper school and lower school and, at the lower school rack, plug patch panel A port 30 into the Juniper in the rack; just make sure only one of the feeds is connected at any one time. Assuming your lower school's old Internet feed is still operational, this will re-establish the network as two separate LAN's. On the other hand, this makes the expensive fiber connection between the upper school and lower school a waste of money, and you'd still be paying for two Internet connections.

You could set up a DHCP pool (preferrably with an IP range different from the ranges you are currently using so that its use is easy to identify) in the XMS-C management system, and associate (all) Xirrus arrays to it. This makes the Xirrus arrays act as routers. Xirrus/Riverbed **recommends against using this feature**, but it is available for emergencies as a **temporary** work-around.

You could change the DHCP settings of your router to expand the range of IP addresses available. A /23 subnet mask (255.255.254.0) gives you two octets of addresses (510 usable addresses), while a /22 (255.255.252.0) gives you four octets (1022 usable addresses).

I hope this gives you a starting point for your IP address problems. Searching the Internet, reading networking books, etc. should give you the knowledge you need to resolve these problems.

From: John B. Williams <jwilliams@itcaretech.com>
Sent: Tuesday, February 6, 2018 2:45 PM
To: Alex Tan
Subject: Re: River Oaks install complete & summary

Alex we are having issue with duplicate IPs. We are migrating to the new switches. Any idea why we would be experiencing this issue? There are over 300 devices in the school and many of them use ips.

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From: Alex Tan <Alex.Tan@uniti.com>
Sent: Thursday, January 25, 2018 5:45:49 PM
To: Matt Sanches; John B. Williams
Cc: dnordman@romustangs.com
Subject: River Oaks install complete & summary

I went to River Oaks at the end of the school day and successfully updated JunOS on the lower school Juniper to match the two upper school Junipers. This completes the current install order, although I believe John Williams needs to talk to Sales about a follow-up order.

I want to point out that the upper school and lower school each have a separate Internet feed, which caused me problems during installation until I figured it out. ALL the **new** networking equipment (including the lower school Juniper and the lower school Xirrus arrays) is currently connected to the upper school's Internet feed, so they are part of the upper school LAN. The connections from the upper school run from the upper school front office "vault" MDF to upper school new cabinet patch panel A port 14 to lower Juniper port 0/0/47. The lower Juniper connects via PowerConnect cable to the upper Juniper in that cabinet and via fiber run to the lower school Juniper.

I also want to point out that upper school IP addresses 192.168.1.11 through 192.168.1.13 are in use even though my IP scanning software could not see anything at those addresses. This caused more problems during install until I re-configured the switches to use static IP addresses 192.168.1.21 through 192.168.1.23.

Upper School Network Information Learned
IP Range: 192.168.1.0 - 192.168.1.255
Subnet Mask: 255.255.255.0 (/24)
Default Gateway: 192.168.1.1
DHCP Server: 192.168.1.1
DNS: 192.168.1.1

Lower School Network Information Learned
IP Range: 10.1.10.0 - 10.1.10.255
Subnet Mask: 255.255.255.0 (/24)
Default Gateway: 10.1.10.1
DHCP Server: 10.1.10.1
DNS: 10.1.10.1

Juniper network switches
192.168.1.21 - swjunros1poe - 48-port PoE - upper school library lower switch
192.168.1.22 - swjunros2 - 48-port non-PoE - upper school library upper switch
192.168.1.23 - swjunros3poe - 48-port PoE - lower school computer lab
root account password = r0smust@ngs
admin account password = must@ngs

Xirrus wireless networking arrays
primarily managed via cloud at https://login.xirrus.com
administrator accounts set for
- jwilliams@itcaretech.com - John Williams
- dnordman@romustangs.com - Dr. Nordman
- xirrus@nexussystems.net - Uniti Fiber - can be deleted now that install is complete or left in place against future need (most customers choose to leave in place just in case)

Original administrator account webmaster@romustangs.com (Coach Lebleau) deleted as previously instructed by John Williams.
When Xirrus arrays can not communicate with the XMS-C cloud management system at xirrus.com, they can be managed via logging into their IP address. The arrays get their IP addresses from the DHCP server, so consult your DHCP server IP leases when you need the IP addresses. When using this method of management the account name is admin and the password is admin.